

**IEEE CINCINNATI
SECTION
NEWSLETTER
MARCH 2004**



**MARCH MEETING
TOYOTA PRIUS
HYBRID ELECTRIC AUTOMOBILE**

DATE: Thursday, March 25, 2004

PLACE: Raffel's – 10160 Reading Road (see below for directions)

TIME: 5:30 p.m. to 7:00 p.m. - Social Time/Dinner
7:00 p.m. to 8:30 p.m. - Program

COST OF DINNER: \$10.00 for Student Members
\$15.00 for Members
\$20.00 for Non-Members

Please call the Cincinnati Section Voice Mailbox at **513-629-9380**, by **Noon, Tuesday, March 23, 2004** if you plan to attend. Please leave your Name, IEEE Member Number, and a daytime telephone number. You can also make a reservation by e-mailing out Arrangements Chair, Charlie Nash, at cnash@ieee.org.

MENU SELECTIONS: Boneless Chicken Breast Marsala, Salisbury Steak, Baked Ham with Pineapples, Homemade Macaroni and Cheese, Scalloped Potatoes, Seasoned Green Beans, Tossed Salad, Dinner Rolls and Butter, Assorted Fruit Pies, Coffee, Tea Iced Tea, Soft Drinks. There is also a bar available for the purchase of alcoholic drinks. Raffel's is located at 10160 Reading Road, south of Glendale-Milford Road on the east side of Reading. Take I-75 to the Glendale-Milford Rd. Exit, go east on Glendale-Milford Road approximately 3/4 of a mile to Reading Rd. and turn right on Reading.

ABOUT THE MEETING: Johnny Holton from Toyota will be giving us a presentation on the Prius hybrid electric automobile. He will be giving us an under-the-hood and in-the-trunk description of the Prius, including drive train, power system, and batteries and will drive a Prius to the meeting for us to see..

CHAIR'S MESSAGE

by Fred Nadeau, Section Chair

This February Section meeting was especially interesting since we held it during Engineers Week at Harris Corporation on the topic of high-definition (HD) terrestrial radio transmitters. Harris is a leader in this area and has had a beta site in a Cincinnati radio station the last three years. The HD radio was designed with the US In-band On-Channel (IBOC) system standard although Harris showed us several other radio design alternatives including pure digital radio to be marketed in the future. The demonstration of the new IBOC transmitter using a standard, off-the-shelf AM/FM radio with a Kenwood add-on decoder unit clearly showed a marked improvement in clarity of the AM signal reception. We wish to thank Harris Corporation, especially Mr. Gary Liebisch, the briefing presenter, Mr. John Ferman, our host for the program, Mr. Randy Restle, Mr. Paul Moore and Mr. Geoff Mendenhall, Vice President of Engineering at the Mason facility.

Our next technical Section meeting will feature a presentation by Toyota Motors on the Prius hybrid gas-electric automobile. I am hoping all of you will make an attempt to see this new state-of-the-art automobile. The hybrid has been on the market now for a few years and has demonstrated over 50 miles/gallon. It may very well revolutionize the auto industry.

Fred Nadeau, Section Chair
E-mail: f.nadeau@ieee.org
Phone No. 937-289-2800

NEW MEMBERS

The following individuals are IEEE members who are new to our Section:

Peter J. Baker	James R. Garner	Jerome T. Pike
Sarah B. Blickenstaff	Huaizhong Han	Harshad S. Sane
Tim Carney	Sanjiv M. Karani	Greg K. Silence
Kurt P. Ericksen	Huazhou Liu	Eberhard Vonhof
Scott P. Fowler	Everett Livingston	Xiaodong Wang

We wish to welcome these new members to our Section!!!

Scanning the Past: A History of Electrical Engineering from the Past

Submitted by Dick Reiman, Historian

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Louis Alan Hazeltine

Seventy five years ago this month, the Proceedings of the Institute of Radio Engineers (IRE) included a paper by Alan Hazeltine on audion oscillators. At the time he was teaching electrical engineering at the Stevens Institute of Technology in Hoboken, New Jersey, He later wrote that he could trace "all of my subsequent radio work and what success I have achieved to this paper."

In his paper, Hazeltine explained that the audion consisted of an evacuated tube with three electrodes: an incandescent filament, a grid, and a plate, He stated that he had written the paper in an effort to provide general principles and to show how to determine the criterion for oscillation from the characteristics of the tube and the associated circuit parameters, He pointed out that tube behavior was much more predictable in high-vacuum tubes than in "ordinary bulbs" where ionized gas molecules exerted a significant effect on performance. He introduced the term mutual conductance and showed how it could be determined from the dynamic slope of a characteristic curve of plate current as a function of grid voltage. He included circuit diagrams for a variety of oscillators and discussed applications in radio receivers and in wire telephony. He derived formulas that indicated the necessary values of mutual conductance to initiate and sustain oscillation in different circuits.

Hazeltine was born in 1886 in Morristown, New Jersey, and graduated in mechanical engineering from the Stevens Institute of Technology in 1906. He then spent a little over a year in the testing department of the General Electric Company in Schenectady, New York, He returned to Stevens to teach electrical engineering beginning in 1907 and became department head in 1917, He was stimulated by early papers of Edwin H. Armstrong to begin research on vacuum-tube circuits and became active in both the IRE and the Radio Club

of America. He was elected a Fellow of the IRE in 1921 and later served as President of the IRE in 1936. Hazeltine authored a textbook entitled Electrical Engineering, which was published in 1924. He achieved a reputation as an inspiring teacher and his teaching was said to have been "orderly and methodical." .

In 1918, Hazeltine became a radio consultant to the U.S. Navy and designed a receiver for use on destroyers. The receiver, known as the SE 1420, was highly regarded and enjoyed long usage. In 1922, he designed a receiver suitable for broadcast reception that employed neutralization of internal capacitive coupling in high-gain amplifiers. Commercial versions of this receiver, known as the neutrodyne, were introduced in 1923, and, the following year, the Hazeltine Corporation was founded to manage his neutrodyne patents and provide engineering services to clients. Neutrodyne receivers were made by more than 20 firms during the 1920s and Hazeltine received approximately \$3,000,000 in royalties from licensees by 1927. The advent of screen-grid tubes beginning in 1926 quickly rendered the neutrodyne obsolete.

Hazeltine ended temporarily his tenure at Stevens in 1925. He lived in Europe for two years in the early 1930s and studied mathematics and art history in France before returning to the United States. In 1933 he resumed his teaching career at Stevens as Professor of mathematical physics and continued teaching until 1944. During World War II, he served as a consultant to the Office of Scientific Research and Development. After the War, he contributed to the development of television and did consulting work for the Hazeltine Corp.. He received 36 patents during his career. He was a mentor and colleague of Harold Wheeler, who wrote a biography entitled Hazeltine the Professor published in 1978. Hazeltine died in 1964 at the age of 78.

*James E. Brittain
School of History, Technology, and Society
Georgia Institute of Technology*

TO SUBSCRIBE TO THE ELECTRONIC NEWSLETTER

This newsletter is only available via e-mail or the Section's web page at <http://ieee.cincinnati.fuse.net/> with the exception of new Section members (one issue only) or members who have specifically requested a copy be delivered through the U. S. Mail.

If you are a new Section member and would like to get this newsletter electronically, please contact Bob Morrison (Editor) at **513-287-3697** or by e-mail at j.r.morrison@ieee.org. Provide your name and member number. In case there are questions, please include a daytime telephone number as well.

If you would like the "Snail Mail" version, you must contact Bob Morrison via the above means or call the Section's voice mail at **513-629-9380**.

Illuminating Engineering Society March 2004 Meeting *"The Science, Art , and Magic of Landscape Lighting Design"*

Date:	March 17, 2004	Cost:	\$10.00 Members \$10.00 Students \$15.00 Non-members
Time:	5:30 pm Social Hour / Dinner Provided 6:30 pm Presentation	RSVP: By Friday March 12th	bkrekeler@hixson-inc.com 513-241-1230
Location:	Hixson — Daylighting Room 659 Van Meter Street, Cincinnati, Ohio		

As spring quickly approaches and thoughts of green landscapes are on our minds, we invite you to join us for an exterior lighting presentation by Peter Hugh, president of Hugh Lighting Design from Chicago, Illinois. With over eighteen years of design experience, Peter will show how various lighting techniques enhance architecture, create drama, improve safety and comfort, and more. Peter is a member and guest speaker for the Illuminating Engineering Society of North America and the International Association of Lighting Designers.

Visit www.ovs-iesna.org for Peter Hugh's bio and details.

Landscape lighting product tabletops will be on display prior to and after the meeting.

IEEE NEWS

IEEE's "The Institute" Online Alert

IEEE's "The Institute" has been updated with new content, including:

IEEE Fellow Focuses on Engineering Education

As the first tenured female professor in the electrical engineering department at Texas Tech University, in Lubbock, USA, 20 years ago, Karan Watson stood almost alone. The few young female engineering student there would often seek her out for perspective, advice, and mentoring. That experience led her to focus her energies on getting more women and underrepresented groups into the field. Read more about Watson at http://www.theinstitute.ieee.org/portal/index.jsp?pageID=institute_level1_article&TheCat=1016&article=tionline/legacy/inst2004/feb04/2w.profile.xml

IEEE Asks, Why Choose Engineering?

Two surveys, one sponsored by IEEE Educational Activities and the other by IEEE Spectrum and IEEE-USA, report similar reasons why engineers decide to enter the field, and that is because they like to find out how things work. Read about the rest of the surveys' results and also how you can participate in a continuing Educational Activities survey at http://www.theinstitute.ieee.org/portal/index.jsp?pageID=institute_level1_article&TheCat=2201&article=tionline/legacy/inst2004/feb04/2w.featuresurvey.xml

Last Chance to Renew 2004 Membership

If you haven't renewed your 2004 membership yet, you have until February 13. To access the secure online renewal application, log in with your IEEE Web Account, or use your member number and your personal identification number. You can pay your dues with a credit card. Renew at <https://myieeemembership.ieee.org/renewal/RenewalLogin>

Job Site Receives Top Honors From Job Seekers Web Guide

The publishers of "Weddle's 2004 Job Seeker's Guide to Employment Web Sites" chose the IEEE Job Site as one of the top 30 out of an estimated total of 40 000 online recruitment sites. Learn why the site received this honor at http://www.theinstitute.ieee.org/portal/index.jsp?pageID=institute_level1_article&TheCat=2010&article=tionline/legacy/inst2004/feb04/2w.prodjobsite.xml

Wanted: A Few Good Energy-Conservation Designs

Students with ideas about how to build a more efficient electric motor or a way to link alternative energy sources to the existing power system could win US\$35 000 in the 2005 International Future Energy Challenge competition. Proposals are due April 10, 2004. Find out how to enter at http://www.theinstitute.ieee.org/portal/index.jsp?pageID=institute_level1_article&TheCat=1003&article=tionline/legacy/inst2004/feb04/2w.deadineseenergychallenge.xml

Board Approves Limited E-Mail Voting

IEEE units such as societies, technical councils, and committees can now vote by e-mail on a limited number of actions affecting their organizations, such as formal motions proposed by members. The Board of Directors approved this bylaw change at its November meeting. Read more at http://www.theinstitute.ieee.org/portal/index.jsp?pageID=institute_level1_article&TheCat=2003&article=tionline/legacy/inst2004/feb04/2w.newsboard.xml

Upgrade Makes IEEE Xplore Easier to Explore

IEEE Xplore, the document delivery system for all of IEEE's journals, magazines, and conference proceedings, is now bigger and better than ever, thanks to its latest release. Read more about the improvements at http://www.theinstitute.ieee.org/portal/index.jsp?pageID=institute_level1_article&TheCat=2202&article=tionline/legacy/inst2004/feb04/2w.newsxploremr.xml

Former NEC Chair Receives Medal of Honor

Tadahiro Sekimoto, former chair of NEC Corp., Tokyo, is the recipient of the 2004 IEEE Medal of Honor. An IEEE Life Fellow, Sekimoto is recognized for his remarkable career in the field of digital satellite communications, his promotion of information technology R&D, and his technical and corporate leadership in computers and communications. Find out more about Sekimoto and the other recipients of this year's awards at http://www.theinstitute.ieee.org/portal/index.jsp?pageID=institute_level1_article&TheCat=2202&article=tionline/legacy/inst2004/feb04/2w.newawards.xml

African Web Site Focuses on Standards

If developing standards requires nothing else, it demands excellent communications within business communities. This is no easy task with Africa's diversity and often poor communications and transportation systems, but it's being attempted by the IEEE with its new StandardsAfrica Web site. Learn more about the site at http://www.theinstitute.ieee.org/portal/index.jsp?pageID=institute_level1_article&TheCat=2202&article=tionline/legacy/inst2004/feb04/2w.newsstandards.xml

Marketplace: The Mother of Invention

This past holiday season, dog lovers could finally discover what their dogs were saying with a US\$100 gadget called Bowlingual, a device that translates a dog's barks into words. Although inventions such as this may seem unnecessary and frivolous, they're often based on serious science. For example, Bowlingual uses voiceprint technology to create digital representations of sounds. What inventions, whether serious or silly, would you like to see in the next 10 years? Weigh in at http://www.theinstitute.ieee.org/portal/index.jsp?pageID=institute_level1_article&TheCat=1021&article=tionline/legacy/inst2004/feb04/2w.marketplace.xml

IEEE Foundation Grants Reach Far

One small action can have an ever-expanding reach according to the IEEE Foundation, the philanthropic arm of the IEEE. A few examples of projects it has funded that are having a long-lasting impact are at http://www.theinstitute.ieee.org/portal/index.jsp?pageID=institute_level1_article&TheCat=2201&article=tionline/legacy/inst2004/feb04/2w.featurefound.xml

Power Engineering Society General Meeting Proceedings Released

The proceedings on the 2003 IEEE Power Engineering Society General Meeting are now available through the IEEE Online Catalog & Store. Topics covered included asset management, risk management, developments in power-engineering technologies, and more. For more information, or to purchase the proceeding, visit <http://shop.ieee.org/store/product.asp?prodno=CH37491>

The Institute Seeks Government Advisors

Have you acted as an advisor on technical issues to your city, state, provincial, or federal government? If so, we'd like to speak to you about your experiences, especially if you live outside the United States, for an upcoming article in The Institute. Write to us at institute@ieee.org

The most current version of The Institute can always be found at <http://www.ieee.org/theinstitute>

Broad Coalition of Energy Organizations Urges Restoration of Support for Research on Electric Transmission, Distribution to Improve Reliability, Prevent Future Blackouts

WASHINGTON (February 19, 2004) - The Administration and Congress should restore \$26 million in funding for Department of Energy (DOE) base programs into research and development on electricity transmission and distribution in FY 2004, according to a coalition of energy organizations, industry leaders and experts coordinated by IEEE-USA.

Further, in an open letter to Congress and the Administration, the group urged identifying grid-related research as a clear national priority, warranting research funding "commensurate with the importance of the task of revitalizing the nation's power grid."

Despite growing recognition of the need for grid investment in the wake of August 2003's major American and Canadian blackout, final FY 2004 congressional budgetary actions resulted in an effective 33 percent cut in funding for DOE base research program related to the electric grid.

"The August blackout was a clarion call to increase, not decrease, investment in infrastructure and R&D to modernize and upgrade the power grid," IEEE-USA President John Steadman said. "The nation's economy and national security depends on a reliable and affordable supply of electricity to consumers and industry."

"Electricity reliability is critical to the nation's economy, security and sustenance of modern life," the coalition noted. Given the difficulties associated with expanding the grid using conventional approaches, it urged increased funding for "new technologies and control strategies that can increase the capacity of existing pathways."

According to IEEE-USA, necessary investments to assure reliability and avoid future blackouts requires not only the construction of additional power lines and generating plants, but also innovation and the development of new technologies and control strategies to improve system reliability.

The letter to Congress and the Administration is available at <http://www.ieeeusa.org/forum/issues/electricreliability/openletter.pdf>.

The coalition includes the American Council for an Energy-Efficient Economy (www.aceee.org), the Coalition for the Commercial Application of Superconductors (<http://www.ccasweb.org>), the Consortium for Electric Reliability Technology Solutions Industry Advisory Board (<http://certs.lbl.gov/>), the Electric Power Supply Association (www.epsa.org), the Electricity Storage Association (<http://www.electricitystorage.org/>), the Energy Storage Council (www.energystoragecouncil.org/), the National Electrical Manufacturers Association (<http://www.nema.org>), the Power Systems Engineering Research Center (<http://www.pserc.wisc.edu>), the U.S. Combined Heat and Power Association (www.nemw.org/uschpa/), industry leaders and experts.

Oklahoma School Wins IEEE-USA National Award

WASHINGTON (February 25, 2004) - St. Philip Neri School of Midwest City, Okla., won the fourth IEEE-USA Best Communications System Award at the national finals of the National Engineers Week Future

City Competition on Wednesday. The honor, one of 22 special awards presented at the Hyatt Regency Hotel-Capitol Hill, was for the most "efficient and accurate communications system."

Students Alyssa Grossen, 13; David Hoang, 14; and Lauren Mathias, 12, comprised the team with St. Philip Neri teacher Sue Hawkins and electrical engineer Wayne Recla. The team advanced to Washington by winning the Oklahoma regional competition last month. Its city, Chrysalis, is set in the year 2237.

The featured components of St. Philip Neri's communications system are antennas and titanium microchips. An embedded microscopic finger phone transmits voice into an electrical signal through a diaphragm amplifier and antenna. The signal goes to a tower and then to a receiver. Each person's head is embedded with an antenna and microchip that converts the signal into vibrations that are transmitted via bone conduction to the cochlea of the inner ear.

"The concepts behind their system were solid, consistent and well-connected," said award judge Domonique Green, who served with fellow IEEE member and judge Lowell Smith. "Their idea wasn't just focused on one form of communication. They thought about the future and how their system would be an asset to everyone."

IEEE Senior Member Joe Lillie of Lafayette, La., chair of National Engineers Week 2004, presented each team member with a plaque and \$100 U.S. Savings Bond. IEEE member Todd Hiemer is a co-regional coordinator for the Oklahoma competition.

The Future City Competition, which IEEE-USA introduced to Engineers Week in 1993, is designed to encourage the future generation of engineers. Seventh and eighth grade students create their own vision of a city of tomorrow, working first on computer and then constructing three-dimensional scale models. About 30,000 students competed this past year. Pittsburgh regional champion Riverview Junior / Senior High School won the overall competition Wednesday. Visit www.futurecity.org or www.eweek.org for more information.

Unemployment Rate for Electrical Engineers and Computer Scientists Reaches All-Time High in 2003

WASHINGTON (February 26, 2004) - The unemployment rate for U.S. electrical and electronics engineers (EE's) averaged a record 6.2 percent in 2003, a two percent increase over the previous year, according to data compiled by the Department of Labor's Bureau of Labor Statistics (BLS). The previous high of 4.3 percent was set in 1994.

The 2003 rate is more than three times the level in 2001 (2.0 percent) and over four times the figure for 2000 (1.3). The average 2003 unemployment rate for all workers was 5.6 percent.

While recent EE unemployment has risen, the number of employed EE's has fallen. BLS reported 386,000 employed EE's in the second quarter last year vs. 349,000 in the fourth quarter, a decline of 37,000.

"The continuing high levels of engineering unemployment are not surprising considering the trend toward outsourcing of high-tech jobs overseas," IEEE-USA President John Steadman said. "This offshoring of high-paying jobs may look good on the bottom line of a quarterly financial report, but it's certainly not good for the skilled technical professional who can't find a job."

The 2003 jobless rate for computer scientists and systems analysts reached an all-time high of 5.2 percent, an increase of .2 percent over 2002 and four times as high as 1998's 1.3 percent. The rate also jumped .6 percent from the third to fourth quarters of 2003 to stand at 5.4 percent.

The quarterly EE jobless rate fell from 6.7 percent to 4.5 percent in the final quarter. The number of employed EE's, however, remained steady at 349,000. The discrepancy could be explained by discouraged EE's no longer counting as officially unemployed because they either found work in another field, or just stopped looking. BLS reports that the number of unemployed EE's dropped from 25,000 to 16,000 from the third to fourth quarters.

The quarterly unemployment rate for computer hardware engineers jumped dramatically from 6.9 to 9.0 percent, and averaged 7.0 for 2003. Computer software engineers saw their jobless rate fall slightly from 4.6 to 4.5 percent (5.2 for 2003); and computer programmers experienced a drop from 7.1 to 4.6 percent (6.4 for the year). The rate for aerospace engineers rose a percentage point to 5.0 percent, and finished at 4.8 percent for the year.

Comparisons to previous years are difficult because BLS revamped its occupational classifications and reporting conventions after 2002.

The IEEE Cincinnati Section Executive Committee **Member Names and Phone Numbers**

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